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PERFORMANCE ORIENTED PACKAGING TESTING OF CONTAINER FOR THE MK 50 TORPEDO LANYARD START ASSEMBLY FOR PACKING GROUP II SOLID HAZARDOUS MATERIALS

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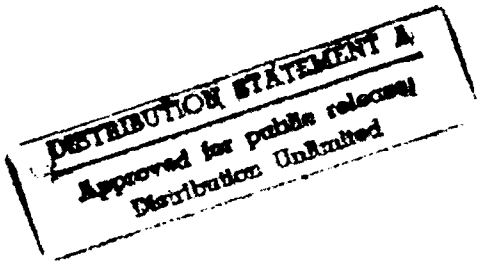

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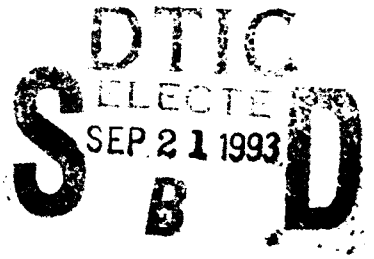

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13. ABSTRACT (Maximum 200 words)

This Performance Oriented Packaging (POP) test was conducted to ascertain whether the Container for the Mk 50 Torpedo Lanyard Start Assembly (P/N PPP-B-1672 Type II Style D) meets the Packing Group II requirements specified by the Code of Federal Regulations, Title 49 CFR, Parts 106 through 178, dated 1 October 1992. The packaged commodity used for the test was a simulated weight of 0.16 kg (0.34 pounds). This represents the current maximum commodity weight. To compensate for future growth variations in commodity and/or packaging, 0.75 kg (1.66 pounds) were added. Gross weight of the loaded container was 1.47 kg (3.23 pounds). The test results indicate that the container has conformed to the POP requirements.

14. SUBJECT TERMS

POP Test of Container for the Mk 50 Torpedo Lanyard Start Assembly

15. NUMBER OF PAGES

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INTRODUCTION

This Performance Oriented Packaging (POP) test was performed to ascertain whether the Container for the Mk 50 Torpedo Lanyard Start Assembly (P/N PPP-B-1672 Type II Style D) meets the Packing Group II requirements specified by the Code of Federal Regulations, Title 49 CFR, Parts 106 through 178, dated 1 October 1992. The packaged commodity used for the test was a simulated load of 0.16 kg (0.34 pounds). This represents the current maximum commodity weight. To compensate for future growth variations in commodity and/or packaging, 0.75 kg (1.66 pounds) were added. Gross weight of the loaded container was 1.47 kg (3.23 pounds).

TESTS PERFORMED

1. Base Level Vibration Test

This test was performed in accordance with Title 49 CFR 178.608. The container was placed on a repetitive shock platform which has a vertical linear motion of 1-inch double amplitude. Movement of the container was restricted during vibration in all but the vertical direction. The frequency of the platform was increased until the container left the platform 1/16 of an inch at some instant during each cycle. Test time was 1 hour.

2. Stacking Test

This test was performed in accordance with Title 49 CFR 178.606. The container was subjected to a force applied to its top surface equivalent to the total weight of identical packages stacked to a minimum height of 3 meters (including the test container). A weight of 48.35 kg (106.59 pounds) was stacked on the test container. The test was performed for 24 hours. The weight was then removed and the container examined.

3. Drop Test

This test was performed in accordance with Title 49 CFR 178.603. Five drops were performed from a height of 1.2 meters (4 feet), impacting the following surfaces:

a. Flat bottom.

b. Flat top.

c. Flat on long side.

d. Flat on short side.

e. One corner.

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4. Cobb Test

This test was performed in accordance with TAPPI Method T441 om-90. Ten samples were tested for absorbency, five on the exterior and five on the interior side. The faces were exposed to 100 milliliters of deionized water for a period of 30 minutes.

PASS/FAIL

1. Base Level Vibration Test

The criteria for passing the base level vibration test is outlined in Title 49 CFR 178.608(c): No test sample should show any deterioration which could adversely affect transportation safety or any distortion liable to reduce packaging strength.

2. Stacking Test

The criteria for passing the stacking test is outlined in Title 49 CFR 178.606(d): No test sample may show any deterioration which could adversely affect transportation safety or any distortion likely to reduce its strength, cause instability in stacks of packages, or cause damage to inner packagings likely to reduce safety in transportation.

3. Drop Test

The criteria for passing the drop test is outlined in Title 49 CFR 178.603(f): A package is considered to successfully pass the drop tests if for each sample tested, no rupture occurs which would permit spillage of loose explosive substances or articles from the outer packaging.

4. Cobb Test

The criteria for passing the Cobb test is outlined in Title 49 CFR 178.156(b): No test sample shall have water absorption greater than 155 grams per square meter.

TEST RESULTS

1. Base Level Vibration Test

Satisfactory.

2. Stacking Test

Satisfactory.

3. Drop Test

Satisfactory.

4. Cobb Test

Satisfactory.

DISCUSSION

1. Base Level Vibration Test

The input vibration frequency was 4.5 Hz. Immediately after the vibration test was completed, the container was removed from the platform, turned on its side and inspected. No unfavorable distortion or deterioration was observed.

2. Stacking Test

The container was inspected after the 24-hour period was over. No unfavorable distortion or deterioration was observed.

3. Drop Test

After each drop, the container was inspected. The contents were completely retained by the container.

4. Cobb Test

The samples were weighed for water absorbency and were found to be 100.20 grams per square meter for exterior and 100.60 grams per square meter for the interior of the boxes. The test was performed by AMXLS-TE-E Tobyhanna, Pennsylvania (Test Report SR-7-7-93).

REFERENCE MATERIAL

A. Code of Federal Regulations, Title 49 CFR, Parts 106-178.

B. Bureau of Explosives Tariff No. BOE 6000K Hazardous Materials Regulations of the Department of Transportation by Air, Rail, Highway, Water including Specifications for Shipping Containers.

C. TAPPI Method T441 om-90.

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Crane, IN 47522-5000

TEST DATA SHEET

POP MARKING: UN 4G/Y1.5/S/**/USA/DOD/NAD **YEAR LAST PACKED OR MANUFACTURED	
Nomenclature: Container for the Mk 50 Torpedo Lanyard Start Assembly	
Type: 4G	**NSN:** 8115-01-057-1244
Drawing Number or P/N: PPP-B-1672 Type II Style D	**Outer Packaging Material:** Fiberboard
Dimensions: 10" L x 10" W x 3-1/2" H	**Gross Weight:** 1.47 kg (3.23 pounds)
Closure (Method/Type): Tape, PPP-T-76 Type III or IV	**Tare Weight:** 0.56 kg (1.23 pounds)
Additional Description: Folding fiberboard box	

PACKAGED COMMODITY:		
Nomenclature: See table 1	**NSN(s):** See table 1	
United Nations Number: See table 1		
United Nations Packing Group: II		
Physical State (Solid, Liquid, or Gas): Solid		
Vapor Pressure (Liquids Only): N/A	**At 50 °C:** N/A	**At 55 °C:** N/A
Consistency/Viscosity: N/A	**Density/Specific Gravity:** N/A	
Amount per Package: See table 1	**Flash Point:** N/A	
Net Weight: See table 1		

PACKAGED COMMODITY USED FOR TEST:	
Name: Simulated Shape	**Physical State:** Solid
Consistency: N/A	**Density/Specific Gravity:** N/A
Test Pressure (Liquids Only): N/A	**Net Weight:** 0.91 kg (2.0 pounds)
Additional Description: The net weight includes the current maximum commodity weight plus an additional 0.75 kg (1.66 pounds).	

N/A = Not Applicable

TABLE 1
Commodities Approved for Shipping in the Container for the Mk 50 Torpedo Lanyard Start Assembly

NALC/ DODIC	NSN	Commodity Nomenclature	Packing Document Number	Haz Class/Div	UN Number	Units/ Package	Total Net Weight kg (lb)	Total Gross Weight kg (lb)
5W25	1356-01-272-2374	Lanyard Start Assembly	N/A	1.4S	0349	1	0.16 (0.34)	0.72 (1.57)

N/A = Not Assigned